Claims

1. A hydrodynamic bearing motor, comprising:

a shaft supported by a hydrodynamic radial bearing and a hydrodynamic thrust bearing to be rotatable in a relative manner,

a sleeve, and

a driving motor, wherein

a magnet for trapping abraded powder is disposed in a connecting passage between an opening of the sleeve and an opening of the hydrodynamic bearing motor, and members forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing are made of an austenitic stainless.

2. A hydrodynamic bearing motor, comprising:

a shaft supported by a hydrodynamic radial bearing and a hydrodynamic thrust bearing to be rotatable in a relative manner,

a sleeve, and

a driving motor, wherein

a magnet for trapping abraded powder is disposed in a connecting passage between an opening of the sleeve and an opening of the hydrodynamic bearing motor, and one of members forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is made of an austenitic stainless and the other member is made of a material harder than the austenitic stainless.

3. A hydrodynamic bearing motor, comprising:

a shaft supported by a hydrodynamic radial bearing and a hydrodynamic thrust bearing to be rotatable in a relative manner,

a sleeve, and

a driving motor, wherein

a magnet for trapping abraded powder is disposed in a connecting passage between an opening of the sleeve and an opening of the hydrodynamic bearing motor, and one of members forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is made of an austenitic stainless and the other member is made of a material almost equal in thermal expansion coefficient to the austenitic stainless.

4. The hydrodynamic bearing motor according to claim 3, wherein the material almost equal in thermal expansion coefficient to the austenitic stainless is selected from a group including copper, a high copper alloy, phosphor bronze, aluminum bronze, and cupronickel.

5. The hydrodynamic bearing motor according to claims 2 to 4, wherein of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing, at least the facing surface not being made of the austenitic stainless is coated with a ceramic or a diamond like carbon.

6. The hydrodynamic bearing motor according to any one of claims 1 to 4, wherein the magnet for trapping abraded powder has a length of 0.5 mm or longer along the connecting passage, the connecting passage has a width of 2.0 mm or less, and the magnet for trapping abraded powder has a surface magnetic flux density of 0.01 T or higher.

7. The hydrodynamic bearing motor according to claim 5, wherein the magnet for trapping abraded powder has a length of 0.5 mm or longer along the connecting passage, the connecting passage has a width of 2.0 mm or less, and the magnet for trapping abraded powder has a surface magnetic flux density of 0.01 T or higher.

8. The hydrodynamic bearing motor according to any one of claims 1 to 4, further comprising a labyrinth seal with the magnet for trapping abraded powder in the connecting passage between the opening of the sleeve and the opening of the hydrodynamic bearing motor.

9. The hydrodynamic bearing motor according to claim 5, further comprising a labyrinth seal with the magnet for trapping abraded powder in the connecting passage between the opening of the sleeve and the opening of the hydrodynamic bearing motor.

10. The hydrodynamic bearing motor according to claim 8, wherein the magnet for trapping abraded powder has a length of 0.5 mm or longer along the connecting passage, the connecting passage has a width of 10.0 mm or less, and the magnet for trapping abraded powder has a surface magnetic flux density of 0.01 T or higher.

11. The hydrodynamic bearing motor according to claim 9, wherein the magnet for trapping abraded powder has a length of 0.5 mm or longer along the connecting passage, the connecting passage has a width of 10.0 mm or less, and the magnet for trapping abraded powder has a surface magnetic flux density of 0.01 T or higher.

12. The hydrodynamic bearing motor according to any one of claims 1 to 4, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing has a ceramic coating.

13. The hydrodynamic bearing motor according to claim 5, wherein at least one of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing has a ceramic coating.

14. The hydrodynamic bearing motor according to claim 6, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing has a ceramic coating.

15. The hydrodynamic bearing motor according to claim 8, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing has a ceramic coating.

16. The hydrodynamic bearing motor according to any one of claims 7, 9, 10, and 11, wherein at least one of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing has a ceramic coating.

17. The hydrodynamic bearing motor according to claim 5, wherein the ceramic of the ceramic coating is selected from a group including TiN, TiAlN, TiC, TiCN, CrN, SiC, Si_3N_4, Al_2O_3, and cBN.

18. The hydrodynamic bearing motor according to any one of claims 1 to 4, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is coated with a diamond like carbon.

19. The hydrodynamic bearing motor according to claim 5, wherein at least one of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is coated with a diamond like carbon.

20. The hydrodynamic bearing motor according to claim 6, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is coated with a diamond like carbon.

21. The hydrodynamic bearing motor according to claim 8, wherein at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is coated with a diamond like carbon.

22. The hydrodynamic bearing motor according to any one of claims 7, 9, 10, and 11, wherein at least one of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing is coated with a diamond like carbon.

23. The hydrodynamic bearing motor according to claim 18, wherein the diamond like carbon is selected from a group consisting of an amorphous carbon, a hydrogenated amorphous carbon, a diamond like carbon film, and a hard carbon film.

24. The hydrodynamic bearing motor according to any one of claims 1, 7, 9, 10, and 11, further comprising a lubricating film formed on at least one of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing.

25. The hydrodynamic bearing motor according to claim 6, further comprising a lubricating film formed on at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing.

26. The hydrodynamic bearing motor according to claim 8, further comprising a lubricating film formed on at least one of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing.

27. The hydrodynamic bearing motor according to any one of claims 2, 4, 7, 9, 10, and 11, wherein of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust

bearing, a lubricating film is formed at least on the facing surface not being made of the austenitic stainless.

28. The hydrodynamic bearing motor according to claim 5, wherein of the facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing, a lubricating film is formed at least on the facing surface not being made of the austenitic stainless.

29. The hydrodynamic bearing motor according to claim 6, wherein of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing, a lubricating film is formed at least on the facing surface not being made of the austenitic stainless.

30. The hydrodynamic bearing motor according to claim 8, wherein of facing surfaces forming the hydrodynamic radial bearing and the hydrodynamic thrust bearing, a lubricating film is formed at least on the facing surface not being made of the austenitic stainless.

31. The hydrodynamic bearing motor according to any one of claims 25, 26, 28, 29, and 30, wherein the lubricating film is selected from a group consisting of graphite, MoS_2, and PTFE.

32. The hydrodynamic bearing motor according to claim 24, wherein the lubricating film is selected from a group including graphite, MoS_2, and PTFE.

33. The hydrodynamic bearing motor according to claim 27, wherein the lubricating film is selected from a group including graphite, MoS_2, and PTFE.

34. A rotating device, wherein a rotated member such as polygon mirror and a recording disc is attached to the hydrodynamic bearing motor discussed in any one of claims 1 to 3.